

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-16 (Canceled).

Claim 17 (New): A continuous process for fractionating a C₄ fraction by extractive distillation using a selective solvent in an extractive distillation column, wherein a dividing wall is installed in the longitudinal direction in the extractive distillation column to form a first region, a second region and a lower combined column region and a top stream comprising one or more butanes is taken off from the first region, a top stream comprising one or more butenes is taken off from the second region and a stream comprising one or more hydrocarbons from the C₄ fraction which are more soluble in the selective solvent than are the butanes and the butenes is taken off from the lower combined column region.

Claim 18 (New): A process as claimed in claim 17, wherein the stream comprising the hydrocarbons from the C₄ fraction which are more soluble in the selective solvent than are the butanes and the butenes is taken off as a side stream from the lower combined column region and the selective solvent is taken off as bottom stream from the extractive distillation column.

Claim 19 (New): A process as claimed in claim 17, wherein the stream comprising the hydrocarbons from the C₄ fraction which are more soluble in the selective solvent than are the butanes and the butenes is taken off together with the selective solvent as bottom stream from the extractive distillation column.

Claim 20 (New): A process as claimed in claim 17, wherein the C₄ fraction is fed into the first region of the extractive distillation column, the top stream comprising the butanes is taken off from the region of the extractive distillation column and the top stream comprising the butenes is taken off from the region of the extractive distillation column.

Claim 21 (New): A process as claimed in claim 17, wherein two or more, thermally coupled columns are used in place of the extractive distillation column with dividing wall.

Claim 22 (New): A process as claimed in claim 17, wherein the selective solvent used comprises one or more of the substances selected from the group consisting of dimethylformamide, acetonitrile, furfural, and N-methylpyrrolidone.

Claim 23 (New): A process as claimed in claim 17, wherein from 10-80, theoretical plates are located in the region of the dividing wall of the extractive distillation column.

Claim 24 (New): A process as claimed in claim 17, wherein a heterogeneously catalyzed selective hydrogenation of the hydrocarbons comprising triple bonds from the C₄ fraction to hydrocarbons comprising double bonds is additionally carried out in the extractive distillation column.

Claim 25 (New): A process as claimed in claim 17, wherein the stream comprising the hydrocarbons which are more soluble in the selective solvent than are the butanes and butenes which is taken off from the extractive distillation column is fed to a first distillation column in which it is separated into a top stream comprising 1,3-butadiene, propyne, possibly further low boilers and possibly water, and a bottom stream comprising 1,3-butadiene, 1,2-

butadiene, acetylenes and possibly further high boilers, with the proportion of 1,3-butadiene in the bottom stream from the distillation column being regulated so that it is sufficiently high to dilute the acetylenes to outside the range in which there is a risk of spontaneous decomposition and the top stream from the first distillation column is fed to a second distillation column and in this is separated into a top stream comprising propyne, possibly further low boilers and possibly water and a bottom stream comprising pure 1,3-butadiene.

Claim 26 (New): A process as claimed in claim 17, wherein the bottom stream from the first distillation column and the top stream from the second distillation column are passed to a reactive distillation column in which a heterogeneously catalyzed selective hydrogenation of the hydrocarbons comprising triple bonds to hydrocarbons comprising double bonds is carried out by means of hydrogen, with a partial conversion of the acetylenes, to give a top stream comprising 1,3-butadiene, butanes, butenes and non-hydrogenated hydrocarbons having triple bonds and a bottom stream comprising high boilers which is discharged.

Claim 27 (New): A process as claimed in claim 17, further comprising a step wherein the stream comprising the butenes isobutene, 1-butenes and 2-butenes is further processed in a reactive distillation column to give a stream comprising predominantly isobutene and a stream comprising predominantly 2-butenes, with 1-butene being hydroisomerized to 2-butenes in the reactive distillation column and the stream comprising predominantly isobutene being taken off as top stream from the reactive distillation column and the stream comprising predominantly 2-butenes being taken off as bottom stream from the reactive distillation column.

Claim 28 (New): A process as claimed in claim 17, further comprising a step wherein the stream comprising the butenes is subjected to a selective etherification of the isobutene and fractionation to give a stream comprising the isobutene ether and a stream comprising 1-butene and 2-butenes and subsequently further processing the stream comprising 1-butene and the 2-butenes by gas-phase isomerization of the 2-butenes to give a stream comprising predominantly 1-butene or by hydroisomerization of the 1-butene to give a stream comprising predominantly 2-butenes.

Claim 29 (New): A process as claimed in claim 17, further comprising a step wherein the stream comprising the butenes isobutene, 1-butene and 2-butenes, is further processed by skeletal isomerization of 1-butene and 2-butenes to isobutene, giving a stream comprising predominantly isobutene.

Claim 30 (New): A process as claimed in claim 17, further comprising a step wherein the stream comprising the butenes isobutene, 1-butene and 2-butenes, is further processed by separating off isobutene and working it up by skeletal isomerization to give a stream comprising predominantly 1-butene and 2-butenes.

Claim 31 (New): A process as claimed in claim 17, further comprising a step wherein the stream comprising the butenes isobutene, 1-butene and 2-butenes, is further processed by separating off isobutene and processing it further by hydrogenation to give a stream which comprises predominantly isobutane and is preferably fed to a cracker or by skeletal isomerization to give a stream comprising predominantly n-butane and dehydrogenation of the latter to give a stream comprising predominantly 1-butene and 2-butenes.

Claim 32 (New): A process as claimed in claim 17, further comprising a step wherein the stream comprising the butenes isobutene, 1-butene and 2-butenes, is further processed by selective dimerization of isobutene to the corresponding C₈-hydrocarbons and subsequent fractional distillation to give a stream comprising 1-butene and 2-butenes and a stream comprising the C₈-hydrocarbons.

Claim 33 (New): A process as claimed in claim 21, wherein two or three, thermally coupled columns are used in place of the extractive distillation column with dividing wall.

Claim 34 (New): A process as claimed in claim 22, wherein the selective solvent is N-methylpyrrolidone in an eons solution.

Claim 35 (New): A process as claimed in claim 23, wherein 25 theoretical plates are located in the region of the dividing wall of the extractive distillation column.